

# Surgical Drainage Devices

## Improved Securement = Improved Outcomes

By Maureen Carignan, RN and Linda Nelson, RN, BSN

In 1994, the Patient Care Services Department at the Royal Columbian Hospital, a 370 bed acute care, tertiary facility in New Westminster, B.C., (part of the Simon Fraser Health Region) began to investigate alternatives to their existing securement and dressing procedures for surgical drainage devices. The goal was to improve the securement of urinary and chest catheters to prevent accidental dislodgment and improve patient comfort.

Each year, the Simon Fraser Health Region, inserts approximately 2000 chest tubes and approximately 10,000 urinary catheters for post operative drainage of chest and bladders respectively.

Accidental dislodgment of chest catheters following thoracic surgery can seriously compromise pulmonary function by preventing the drainage of air and fluid. This can result in a pneumothorax or

possible tension pneumothorax. When a urinary catheter either is removed accidentally or migrates into the urethra, urethral trauma, infection, urinary retention, and patient discomfort can result.

The impetus to improve catheter securement for urinary catheters began when nursing staff started to report a previously unrecognized post-anaesthesia pain syndrome in patients with indwelling urinary catheters. Eventually named Carignan's Syndrome, after the principal investigator of the problem, Maureen Carignan RN, Clinical Products Co-Ordinator for the SFHR, is a condition characterized by patients experiencing acute post-operative burning pain on emergence from anaesthesia, accompanied by intense restlessness, high pulse and blood pressure and aggressive behavior. Patients literally rose to their feet, insisting on immediate removal of their urinary catheter. A typical patient description was that it felt like the catheter was burning my insides out. These patients invariably required heavy sedation and removal and replacement of their foley catheters.

Possible causes of the acute post-operative pain syndrome were exhaustively researched and data collection was assisted by the operating room nursing staff. Factors that were investigated included:

- The catheter brand and size,
- The preparation solution used,
- The ethylene oxide residue in the balloon inflation fluid,
- Glove composition,
- The type of surgical procedure,
- Procedure length, and
- The catheter insertion technique.

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### Abstract

The use of securement devices to prevent the risks, discomfort and expense of accidental dislodgment of surgical drains was investigated by the Royal Columbian Hospital after nursing staff began reporting a previously unrecognized post-operative pain syndrome. Nursing staff discovered the cause and eliminated the recurring syndrome by taking two preventative measures: securing urinary catheters with a Statlock securement device, and hanging the catheter bags to the OR stable. Both practice changes eliminated traction on the catheter, preventing its migration into the patient's bladder neck that caused the syndrome's symptoms of bladder pain and spasm when the patient woke up. There were modifications to the chest tube securement protocol that also included a Statlock securement device that improved the skin integrity of patients and increased nursing application efficiencies by 100%.



Figure 1

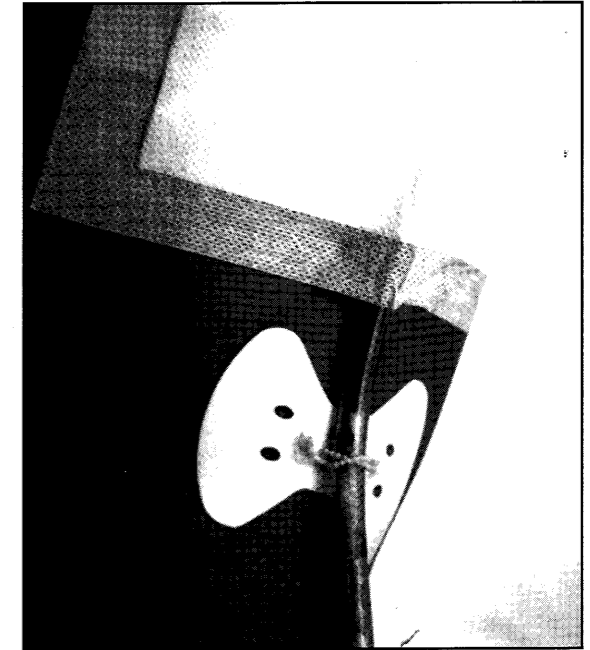


Figure 2

During a one year period, the 52 patients identified with "Carignan Syndrome", were mostly males with urinary catheters inserted in the operating room after they were anaesthetized, and underwent procedures longer than two hours and had catheters secured by placing the drainage tubing underneath the patients thigh. Increased traction on the catheter during lengthy procedures, which invariably involved chemical muscle relaxation, was causing the inflated catheter balloon to slide down into the bladder neck. These patients would then experience intense pain and bladder spasm when they woke up in the recovery room.

Discovering the cause of the post-operative pain syndrome led to two preventative changes in practice. First, a Statlock Foley catheter securement device made by Venetec International San Diego, was used in place of other, less successful means of securement. Second, urinary drainage bags were hooked to the operating room table to decrease traction of the catheter. After these measures were implemented, the syndrome disappeared.

Tube securement options and dressing procedures for chest catheter was also evaluated. Nursing staff in the operating room desired a method to reliably secure the catheter to prevent accidental dislodgment and a dressing that would be easily applied and absorbent. The challenge was to find a dressing method that was simple and easy to apply in the operating room so that the transfer to the

recovery area could be expedited and yet secure enough to prevent dislodgment when the patient begins ambulating post-operatively.

The original standard securement method for chest tubes was a silk suture surgical knot sewn around the chest tube with an overlying gauze and elastic adhesive tape (Figure 1). Although effective in preventing tube dislodgment, patients experienced compromised skin integrity such as blistering, exfoliation of the skin and allergic reaction. As well, the dressing was very labor-intensive.

The modifications to the chest catheter dressing procedure included the application of a Statlock multipurpose securement device and two dressing types. In cases with minimal drainage from the insertion site, and absorbent "island dressing" is applied. For copious drainage, gauze drain sponges and an adhesive mesh tape is applied (Figure 2).

The existing chest tube dressing procedure and the Statlock securement device and dressing were evaluated for 2 months. The new securement method stabilized the catheter and improved the skin integrity of patients. Furthermore, staff member application efficiencies improved by 100%.

The improved method of urinary and chest catheter securement has been implemented throughout the Simon Fraser Health Region. As a result, there has been a reduction in the risks associated with accidental catheter dislodgment, patient discomfort and improved staff efficiencies. ■